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ABSTRACT

Sex differences in memory for human faces is reviewed. It is found that research evidence to date is not conclusive, but where differences exist they favor female superiority over males in facial memory. In particular, evidence is cited to suggest that females are reliably superior to males in their recognition memory for other females. This is explained in terms of attribution theory and motivational differences between the sexes. The argument is made that theoretical explanations of memory for faces are insufficient if they rely solely on traditional information-processing models without including and accounting for differences in self-awareness. The paper concludes with a description of a recent study on recognition memory of photographs of subjects' own faces in which females prove superior to males in recognizing projections of their real self, their most sociable self, their most intelligent self, and their most trustworthy self. (Author)

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# RECOGNITION MEMORY FOR MALE AND FEMALE FACES

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In preparing this paper I discovered an article in my files on face recognition by one of our discussants given at the M.P.A. meetings in 1975. Roy Malpass pointed out that he was a social psychologist interested in racial bias and part of his work involved testing the ability of police officers to recognize photographs of faces. This interest forced him into the direction of making the problem of perception and memory for faces a testing ground for cognitive theories.

In contrast to Roy, I am an old verbal learner and student of mental imagery. My interests in facial memory, however, have introduced me to the literature in social psychology concerned with person perception and social cognition. This shift in interest is correlated I'm sure with the fact that I am a little annoyed at some of my colleagues in perception and memory who continue to investigate faces simply as a convenient, non-verbal, spatial stimulus. To study faces simply as a class of visual objects is similar to studying words as a collection of letters and sounds. And, as we know, most researchers in memory have long abondoned this particular pursuit.

This paper focuses on one part of the research program that my students and I have been conducting for the past four or five years concerned with the question of sex differences in memory for male and female faces. Whenever a psychologist says that males and females differ in some cognitive

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ability, critics are quick to point to several studies which either showed no differences between the sexes or studies which yielded conflicting results. This inconsistency in research findings is not unusual and can be attributed to a number of factors such as differences in subject samples, instructions, and so on. In the case of sex differences in recognition memory for faces the research evidence gathered so far is not conclusive but I detect a slight advantage in the superiority for females over males. Whether or not this advantage is reliable over most conditions, however, is our point of concern.

This superiority may start very early in life. Fagan (1972) discovered that 5- and 6-month old girls had superior immediate memory for photographs of faces than their male counterparts. He suggested that these differences could result from parents' differential treatment of boys and girls beginning in the first days of life. However, in a follow-up study a year later, Fagan (1973) failed to replicate his earlier findings.

In a study of 12-year-old children and 17-year-old adolescents, Ellis, Shepherd & Bruce (1973) found that at both age levels girls were significantly more accurate than boys (81% vs. 70% accuracy) and were particularly better in recognizing other female faces (82% vs. 67%).

In studies with adults some investigators have shown clear differences favoring females over males (e.g., Going & Read, 1974; Witryol & Kaess, 1957) while other researchers suggest that accuracy of performance depends upon the sex of the observer and the sex of the target face. For example, Cross, Cross & Daly (1971) found females reliably better in recognizing other females whereas males recognized male and female faces equally well.

And finally, some investigators such as Shepherd & Ellis (1973), failed to find reliable sex differences in face recognition whereas Laughery and his colleagues found conflicting results. In three separate experiments in

in the same investigation, women proved slightly superior in face recognition to men, men were found superior to women, and finally no differences in performance were detected between the sexes (Laughery, Alexander & Lane, 1971).

Unfortunately, I cannot report that our work at the University of Guelph unequivocally demonstrates clear-cut differences between males and females in their face memorability. In one of my first investigations I discovered that female faces in contrast to male faces contributed to a greater build-up of proactive interference in short-term memory. Furthermore, female subjects were superior to male subjects in recognizing both male and female faces (Yarmey, 1974). I hesitate to put too much confidence in these findings since Al Goldstein and June Chance tell me that they have been unable to replicate the proactive interference in their laboratory. However, my results could not have been purely accidental since they have been replicated in Britain (Forbes, 1977).

Having found differences between males and females in face recognition my next task was to find some appropriate post-hoc explanation. I speculated that motivational differences between the sexes would be a good starting point. The hypothesis goes as follows: women, more so than men, learn very early in life that our culture places a great emphasis on physical appearance, particularly on female beauty. Thus, the cultural stereotype dictates that girls are to be beautiful or attractive, whereas boys are to be strong and powerful. Women as opposed to men should develop a greater sensitivity to faces and should be more accurate in perceiving and remembering female faces since their need to judge their own attractiveness against some standard would promote perceptual sampling of other female faces. Men, on the other hand, as the designated consumers of physical attractiveness, should be more interested in and remember best the attractive face, particularly, the attractive female face.

This hypothesis has been supported in some of our studies at Guelph but not in all. In one of our early investigations we found that female subjects were superior to male subjects, particularly, in their recognition of other females (Paskaruk & Yarmey, 1974). Our next study attempted to isolate certain stimulus factors of male and female faces and compare their effectiveness as predictors for recognition memory (Yarmey, 1975). Subjects rated 200 faces on 7-point scales for one of three stimulus conditions: Attractiveness, Distinctiveness, and Likability. A fourth group, the Control, rated these same pictures for their photographic quality. Subjects were instructed also to remember the faces for a recognition test to be given the next day. Although the three stimulus conditions were superior in performance to the control, they did not differ reliably from each other. Female subjects, however, were superior to males and were particularly better in recognizing male and female faces which differed in their level of distinctiveness. The data also indicated that males remember best faces (both male and female) which differ in their physical attractiveness.

In a sequel to this experiment I again tested the relative effectiveness of physical attractiveness, feature distinctiveness, and likability of faces on recognition memory, but in this study the major focus of interest was whether or not recognition is consistent over a one-month retention period (Yarmey, 1977). Photographs of male and female faces differing in their level of physical attractiveness, distinctiveness, and likability were studied for two seconds each. During the inspection time subjects were required to judge each face's level of attractiveness, or distinctiveness, or likability, and to encode it for a later memory test. One-third of the subjects were tested immediately following inspection, one-third were tested one week later, and the remainder was tested one month later.

The results proved to be reliably consistent over the three test periods. Recognition was slightly but reliably superior for faces encoded for their liking, followed by those encoded for their physical attractiveness, and poorest for those considered for their distinctiveness of features. Limiting our attention here only to differences in performance between the sexes, no main effects were found for male and female subjects, nor for male and female target faces. However, significant interaction effects were found when male and female subjects encoded faces for their physical attractiveness, high attractive female and low attractive males were easiest to recognize. When faces were inspected for their distinctiveness, female faces low in distinctiveness and male faces high in distinctiveness were best remembered. And finally, subjects recognized most easily female faces that were highly likable and male faces that were not likable. These results add strong support to the physical attractiveness stereotype of person perception which states that "what is beautiful is good" (e.g., Dion, Berscheid & Walster, 1972). We now can also say that, "what is remembered are faces that are beautiful and likable, if female, but not male."

Enough evidence has been accumulated to show that males and females differ in their facial memory although these performance differences are not totally consistent for all conditions. The next step, in my opinion, is to formulate a model of face memory which has links with our knowledge of person perception, social learning and memory theory. Let me offer the following approach drawn from such diverse theoretical sources as William James, Erving Goffman, Fritz Heider, Frederick Bartlett, Allan Paivio, Albert Bandura, among others.

When humans interact they select certain people (i.e., faces) to attend to and ignore others. Their behavior is determined by situational factors and their own individual ways of understanding their environment. In

effect, behavior or perceptual-memory responses involve a continuous reciprocal interaction among environmental forces and cognitive processing.

Ordinarily, environmental conditions are highly influential and tend to dominate what a person selects to perceive. Thus, attractive faces, sex of the person, body build, race, roles and status, all work together to encourage attention. When situations become ambiguous or stressful, such as the uncertainty involved in witnessing an accident or crime in progress, attention is even more selective and only certain salient situational cues or stimulus facial cues will be remembered. Studies testing for differences between males and females for facial memory under stressful conditions have yet to be conducted. We do not know what facial features, if any, are salient for male and female faces under ambiguous or emotionally-arousing states.

In addition, we have much to learn about the cognitive factors involved in the memory for faces. Do males and females attend to the same physiognomic details when looking at male and female faces? Research on memory for other-race faces by Ellis, Deregowski & Shepherd (1975) suggests that whites and blacks focus upon different facial features when looking at members of their own race. Perhaps, males and females also use different cognitive strategies in viewing members of their own sex.

Other cognitive factors such as conceptions, beliefs, attitudes also operate to influence memory. Our predispositions to respond in certain ways equip us with specific sets. Thus, if a man sees a pretty woman he may pull his stomach in and straighten his shoulders, or if he sees a menacing man or woman approach him he will prepare some sort of defense. These reactions occur since we attribute intentions to others and these intentions combined with our stereotyped schematic representations of people mediate our expectations

of behavior. It serves our purposes to remember certain faces and the more information we have about that person, the greater the likelihood we will recognize that person later.

So far, this discussion reflects mainly the interactionist position which states that behavior is a function of an interaction between the person and the environment. What needs to be added I think is an emphasis on the role of the self in facial memory. Following the social learning theory of Bandura (1978), I suggest that males and females differ in their memory for male and female faces because they are cognitively appraising the progress of their interaction. In a triadic reciprocal system consisting of behavior, cognition, and environmental influences all three factors operate as a network of factors determining each other. Thus, an observer determines his environment by choosing which stimuli to attend. Looking at one particular person will influence his or her behavior in a reciprocal fashion. That is, an observer's perceptions of someone else will partly determine how and what he feels about his own appearance. Consequently, he may literally or imaginally adjust his own facial appearance according to some internal self-conception of what presentation of identity is appropriate in that context. Whether or not someone will remember the face of another depends in part upon their self-reactions under different environmental circumstances, different activities and different times. Thus, memory for male and female faces depends upon the cognitive structures that arouse, evaluate, and guide behavior as well as provide a reference mechanism of self appraisal.

This approach to memory for faces is more than a simple information-processing model. Typical information-processing theories are concerned mainly with internal mental operations of input, storage, and output. Memory for faces, in addition, has to be concerned with the reciprocal transactions

between cognition, behaviour and environment. As Bandura (1978) puts it "....people are not only perceivers, knowers, and actors. They are also self-reactors with capacities for reflective self-awareness that are generally neglected in information-processing theories based on computer models of human functioning."

My work at Guelph over this past summer has focused on the role of self for both males and females in their perception and memory for faces. This investigation was completed just last week and I apologize to our two discussants for not being able to give them this information much earlier. In order to study the role of self in facial memory I have begun by investigating memory for one's own face rather than memory for others' faces which is the usual procedure.

I use the term "self" to mean a mental image that a person has regarding himself or herself. Following Goffman's approach, I theorized that people have a sense or image of self that represents the "real me" as well as an image of themselves which changes as they move from one social situation to another. The initial question that interested me was whether or not subjects could identify photographs of themselves projecting their most sociable self, their most intelligent self and their most trustworthy self.

Twenty males and twenty females divided evenly into intentional and incidental learning conditions were asked to project these three sets ten times each. The projections were photographed with a Polaroid camera and subjects were asked to judge how accurately each photograph represented the projected characteristic. In addition, subjects were asked to determine which

one photograph of the ten taken best represented each characteristic as well as judging which one photograph of the thirty in total was the best over-all representation of the "real self". A mirror was constantly available for subjects to practise their projections if they wished before being photographed. Inspection times for all subjects was controlled by matching the time taken by each incidental subject to make his or her various ratings with a paired intentional learning subject. The order of set projections was randomly controlled over subjects. On completion of the photographic session subjects were given the recognition test. During an interval of ten seconds subjects indicated whether each face came from the sociable, the intelligent, or the trustworthy condition; if it was the best representation for that category; if it was the best over-all representation of the self; and attached confidence estimations to their judgments. Results were analyzed for hits, false alarms and d'-scores. The analyses indicated that subjects were able to distinguish among the three projections, with the sociable projections being most easily identified, followed by the intelligence projections. Identifications of the trustworthy projections were the poorest of the three role-playing conditions and were reliably lower than those of the sociable projections. Males and females identified the three facial sets equally well and no differences were found between intentional and incidental subjects.

The analysis of subjects' ability to recognize their best representations for the three projections and their stated best over-all photograph revealed that females were vastly superior to males ($p < .001$) and this

superiority was enhanced in particular for judgments of their most sociable representation and their best over-all representation. Once again, there were no differences between intentional and incidental learning conditions. As you might expect, subjects most frequently chose the best sociable face as their best over-all representation.

An analysis of confidence ratings showed that females were much more confident than were males in recognizing their four best projections and, in particular, were more confident for the sociable projection and the best over-all best projection. However, there was little, if any, correlation ($r = .03$) between subjects' confidence ratings and their ability to accurately recognize these projections.

In summary, females are superior to males in recognizing their own facial projections, particularly their best sociable presentation and their best over-all presentation. Intelligent projections and trustworthy projections were more difficult to identify but, in both conditions, females were slightly superior to males. These results were consistent for both intentional learning subjects and incidental subjects which suggests that females, without any intent to encode faces for memorial purposes, are more responsive, reflective, and self-aware of their own facial presentations in general than are males. I will leave it to you to decide whether or not females are also more calculating in their presentation of self-projections.

And finally, what does this research and the other investigations previously cited in this paper, mean to the courts and to the problem of eyewitness testimony? I think it is important to remember that performance differences in facial memory between the sexes may be reliable in certain contexts

and of legitimate interest to psychological researchers but may not be of particular importance to the courts. In fact, I doubt that anyone would want to appear in court as an expert witness and claim that females are superior to males as eyewitnesses. However, a result that deserves emphasis was the finding that subjects' confidence in their ability to recognize their own facial projections was not related to their actual performance. This finding is consistent with several investigations which also have shown that confidence and accuracy of performance are not correlated in facial recognition or in the construction of artists' drawings of suspects. I am sure that the courts will accept this finding and adopt it in due time for their own practices. Nevertheless, I hope that no one is foolish enough to insist that we know enough about the differences between males and females in facial memory to have any practical significance, at least at this time.

References

Bandura, A. The self system in reciprocal determinism. American Psychologist, 1978, April. 344-358.

Cross, J.F., Cross, J., & Daly, J. Sex, race, age, and beauty as factors in recognition of faces. Perception and Psychophysics, 1971, 10, 393-396.

Dion, K.K., Berscheid, E., & Walster, E. What is beautiful is good. Journal of Personality and Social Psychology, 1972, 24, 285-290.

Ellis, H.D., Deregowski, J.B., & Shepherd, J.W. Descriptions of white and black faces by white and black subjects. International Journal of Psychology, 1975, 10, 119-123.

Ellis, H.D., Shepherd, J., & Bruce, A. The effects of age and sex upon adolescents' recognition of faces. Journal of Genetic Psychology, 1973, 123, 173-174.

Fagan, J.F. Infants recognition memory for faces. Journal of Experimental Child Psychology, 1973, 14, 453-476.

Fagan, J.F. Infants delayed recognition memory for faces. Journal of Experimental Child Psychology, 1973, 16, 424-450.

Forbes, D.D.S. Interference effects in facial memory. Paper presented at the annual meeting of the British Psychological Society, Exeter, 1977.

Going, M., & Read, J.D. Effects of uniqueness, sex of subject, and sex of photograph on facial recognition. Perceptual and Motor Skills, 1974, 39, 109-110.

Laughery, K.R., Alexander, J.F., & Lane, A.B. Recognition of human faces: effects of target exposure time, target position, pose position, and type of photograph. Journal of Applied Psychology, 1971, 55, 477-483.

Malpass, R.S. Towards a theoretical basis for understanding differential face recognition. Paper presented at the annual meeting of the Midwestern Psychological Association, Chicago, 1975.

Paskaruk, D., & Yarmey, A.D. Recognition memory for faces. Paper presented at the annual meeting of the Canadian Psychological Association, Windsor, 1974.

Shepherd, J.W., & Ellis, H.D. The effect of attractiveness on recognition memory for faces. American Journal of Psychology, 1973, 86, 627-633.

Witryol, S.L., & Kaess, W.A. Sex differences in social memory tasks. Journal of Abnormal and Social Psychology, 1957, 54, 343-346.

Yarmey, A.D. Proactive interference in short-term retention of human faces. Canadian Journal of Psychology, 1974, 28, 333-338.

Yarmey, A.D. Social-emotional factors in recall and recognition of human faces. Paper presented at the annual meeting of the Midwestern Psychological Association, Chicago, Ill., 1975.

Yarmey, A.D. The effects of attractiveness, feature saliency, and liking on memory for faces. Paper presented at the meeting of the International Conference on Love and Attraction, Swansea, Wales, 1977.